

CLAIMS:

1. A system for processing sample plates with built-in electronic memory for high throughput sample processing comprising:

a data input station for loading information into said built-in electronic memory; and at least one sample processing station operating on the basis of information loaded into said data input station;

said sample plate comprising: a sample plate body that carries a plurality of samples; a memory device that is incorporated into said sample plate body, said memory device having data input and data output means for inputting and outputting information related at least to said samples from and into said at least one sample processing station; and means for permanently attaching said memory device to said sample plate body.

2. The system of Claim 1, further comprising a loading station for loading a said sample plates with a substance selected from the group consisting of samples and sample processing chemicals.

3. The system of Claim 2, further comprising a sample loading station for loading said samples into said sample plates.

4. The system of Claim 1, wherein said sample processing station is selected from the group consisting of a mass spectrometer, an optical spectrometer, Raman spectrometer, an infrared spectrometer, a laser-induced fluorescent spectrometer, a chromatographer, a gel electrophoresis analyzer, and a sample filtering station.

5. The system of Claim 2, wherein said sample processing station is selected from the group consisting of a mass spectrometer, an optical spectrometer, Raman spectrometer, an infrared spectrometer, a laser-induced fluorescent

spectrometer, a chromatographer, a gel electrophoresis analyzer, and a sample filtering station.

6. The system of Claim 3, wherein said sample processing station is selected from the group consisting of a mass spectrometer, an optical spectrometer, Raman spectrometer, an infrared spectrometer, a laser-induced fluorescent spectrometer, a chromatographer, a gel electrophoresis analyzer, and a sample filtering station.

7. The system of Claim 4, wherein said sample plate is selected from the group consisting of a sample plate with samples permanently attached to said sample plate, a sample plate with wells for retaining liquid samples, a sample plate with through channels for passing liquid samples through said channels, a sample plate with through channels filled with a sample treatment substance, a sample plate with a plurality of nozzles for spraying liquid samples through said nozzles, a sample plate made from light transparent materials for optical treatment of samples, a sample plate with chromatographic coating for chromatographic sample separation, a sample plate with a predeposited array of active spots that possess chemical affinity to specific samples, and a sample plate coated with gel substance for eletrophoretic sample treatment.

8. The system of Claim 3, further comprising a plurality of sample plate processing stations and at least one sample plate distribution station for interaction with at least two stations of said plurality for switching the rout of said sample plates between said at least two sample plate processing units.

9. The system according to Claim 8, wherein said means for permanently attaching said memory device to said sample plate body is selected from an adhesive connection and a press fit.

10. The system according to Claim 7, wherein said means for permanently attaching said memory device to said sample plate body is selected from an adhesive connection and a press fit.
11. The system according to Claim 8, wherein said means for permanently attaching said memory device to said sample plate body is selected from an adhesive connection and a press fit.
12. The system according to Claim 7, further comprising a security means for preventing access of unauthorized individuals to said information related at least to said samples.
13. The system according to Claim 7, wherein said memory device comprises an integrated circuit chip containing a central processing unit, random access memory, and non-volatile data storage.
14. The system according to Claim 15, wherein said security means comprises a security information inputted into said non-volatile data storage.
15. The system according to Claim 7, further comprising a holding plate that holds said sample plate and said memory device, said sample plate and said memory device being permanently connected to said holding plate.
16. The system according to Claim 1, wherein said memory device contains information selected from the group consisting of data on said samples, data on said sample plate, data on preceding, current, and future processes associated with said samples and said sample plate, and commands for processing said samples on current and future processing steps.
17. The system according to Claim 7, wherein said memory device contains

information selected from the group consisting of data on said samples, data on said sample plate, data on preceding, current, and future processes associated with said samples and said sample plate, and commands for processing said samples on current and future processing steps.

18. The system of Claim 6, wherein said sample plate is selected from the group consisting of a sample plate with samples permanently attached to said sample plate, a sample plate with wells for retaining liquid samples, a sample plate with through channels for passing liquid samples through said channels, a sample plate with through channels filled with a sample treatment substance, a sample plate with a plurality of nozzles for spraying liquid samples through said nozzles, a sample plate made from light transparent materials for optical treatment of samples, a sample plate with chromatographic coating for chromatographic sample separation, a sample plate with a predeposited array of active spots that possess chemical affinity to specific samples, and a sample plate coated with gel substance for eletrophoretic sample treatment.

19. The system of Claim 18, further comprising a plurality of sample plate processing stations and at least one sample plate distribution station for interaction with at least two stations of said plurality for switching the rout of said sample plates between said at least two sample plate processing units.

20. The system of Claim 17, further comprising a plurality of sample plate processing stations and at least one sample plate distribution station for interaction with at least two stations of said plurality for switching the rout of said sample plates between said at least two sample plate processing units.

21. A method for processing a plurality of samples supported by sample plates with built-in electronic memory comprising a data input station for loading information into said built-in electronic memory, and at least one sample

processing station operating on the basis of information loaded into said data input station, wherein said sample plate comprises a sample plate body that carries a plurality of samples, a memory device that is incorporated into said sample plate body, said memory device having data input and data output means for inputting and outputting information related at least to said samples from and into said at least one sample processing station, and means for permanently attaching said memory device to said sample plate body, said method comprising the steps of:

loading said samples on said sample plate;

inputting into said built-in electronic memory information selected from the group consisting of data on said samples, data on said sample plate, data on preceding, current, and future processes associated with said samples and said sample plate, and commands for processing said samples on current and future processing steps; and

processing said sample plates in accordance with information selected from said group.

22. The method of Claim 21, wherein said step of loading said samples on said sample plate is interlocked with said step of inputting said information into said memory device for carrying out said both steps simultaneously.

23. The method of Claim 21, wherein said step of processing said sample plates comprises processes selected from analyzing said samples, handling said sample plates, loading said samples into said sample plates, passing said samples through said sample plates, inputting data into said memory device, retrieving data from said memory device, treating said samples chemically, and treating said samples with a light.

24. The method of Claim 23, wherein said step of analyzing is carried out with the use of an analyzer selected from the group consisting of a mass

spectrometer, an optical spectrometer, Raman spectrometer, an infrared spectrometer, a laser-induced fluorescent spectrometer, a chromatographer, a gel electrophoresis analyzer, and a sample filtering station.